NASA Advisory Council
National Aeronautics and Space Administration
Washington, DC 20546

Dr. Steven W. Squyres, Chair

December 7, 2015

Mr. Charles F. Bolden, Jr.
Administrator
National Aeronautics and Space Administration
Washington, DC 20546

Dear Administrator Bolden:

The NASA Advisory Council held its fourth public meeting of 2015 at the NASA Johnson Space Center in Houston, Texas, December 1-3, 2015.

As a result of our deliberations, and in accordance with our "two-tier" approach for transmitting recommendations and findings to the NASA leadership, the Council approved one Council recommendation and one Council finding for your consideration (enclosed). The Council also approved one Committee recommendation and four Committee findings for consideration by the respective NASA Associate Administrator. Copies of the latter also are enclosed for your information and awareness.

If you have any questions or wish to discuss further, please contact me.

Sincerely,

Steven W. Squyres
Chair

Enclosures

NASA Advisory Council Recommendation

Further Development of the Human Exploration Architecture
2015-04-01 (Council-01)

Name of Committee:	NASA Advisory Council
Chair of Committee:	Dr. Steven Squyres
Date of Council Public Deliberation:	December 3, 2015
Short Title of Recommendation:	Further Development of the Human Exploration Architecture

Recommendation: The Council was very pleased to see the new information that was provided by NASA at this meeting about the Human Exploration architecture. Especially noteworthy were a one-year crewed "shake-down cruise" in cis-lunar space before the end of the 2020s, and the development of a deep space habitat capable of supporting that activity.

In preparation for the 2017 transition of Administrations, the Council recommends that NASA further develop their plan for future Human Exploration, such that it:

(1) Provides a consistent vision across all elements of the program;
(2) Allows selection of technology investments on a timely basis;
(3) Enhances advocacy and continuity of support that transcends Administrations; and
(4) Provides the ability to respond to changes in the external environment (e.g., funding changes or technology breakthroughs).

The level of detail in the plan need only be sufficient to accomplish the four items listed above.

Major Reasons for Proposing the Recommendation: For the purpose of expanding human presence to the surface of Mars, it is important to define a baseline architecture and plan that encompass the entire Human Exploration program.

Consequences of No Action on the Proposed Recommendation: Possible impairment of the incoming Administration's ability to propose a NASA budget that will adequately support NASA's Human Exploration plans, especially for important near-term technology investment.

NASA Advisory Council Finding

Transition from Low Earth Orbit to the Cis-Lunar Proving Ground

Name of Committee:	NASA Advisory Council
Chair of Committee:	Dr. Steven Squyres
Date of Council Public Deliberation:	December 3, 2015
Short Title of Finding:	Transition from Low Earth Orbit to the Cis-Lunar Proving Ground

Finding: The Council was encouraged to hear that NASA is moving expeditiously on plans to transition from a Low Earth Orbit (LEO) - focused human exploration program toward one focused on the cis-lunar proving ground, as part of a deep space program leading to Mars. An effectively-managed transition will be important because future funding is unlikely to be sufficient for robust deep space exploration and long-term maintenance of a large LEO infrastructure simultaneously.

Even after a shift of focus to cis-lunar space and beyond has occurred, NASA may need to maintain some capability to get astronauts to low Earth orbit. If the Agency concludes that such a capability is necessary, it would be best not to rely on a presumed commercial demand for human access to LEO that may or may not materialize. Taking steps to encourage commercial activity in LEO may not be adequate to guarantee NASA long-term future access to LEO.

NASA Advisory Council – Committee Recommendation

Aeronautics Committee Recommendation
to NASA Associate Administrator for
Aeronautics Research Mission Directorate

University-Led Strategic Aviation Research

Name of Committee:	Aeronautics Committee
Chair of Committee:	Dr. John Borghese, Vice Chair *(for Ms. Marion Blakey, Chair)*
Date of Council Public Deliberation:	December 2, 2015
Short Title of Recommendation:	University-Led Strategic Aviation Rsearch

Finding: The Aeronautics Committee recommends that the communication with the university community be improved by reaching out early and through multiple channels to insure receiving the broadest possible response. Examples include early indications of intent to release a Broad Area Announcement (BAA) and early notification to the research division of institutions to allow appropriate time to generate ideas for proposals.

NASA Advisory Council – Committee Finding

Aeronautics Committee Finding
to NASA Associate Administrator for
Aeronautics Research Mission Directorate

Revolutionary Vertical Lift Technology Project

Name of Committee:	Aeronautics Committee
Chair of Committee:	Dr. John Borghese, Vice Chair *(for Ms. Marion Blakey, Chair)*
Date of Council Public Deliberation:	December 2, 2015
Short Title of Finding:	Revolutionary Vertical Lift Technology Project

Finding: The Aeronautics Committee emphasizes that with a limited budget, the Revolutionary Vertical Lift Technology project is taking the right path and it is a well thought-out plan. The Committee commended the project in doing a very good job in balancing the portfolio with limited resources.

NASA Advisory Council – Committee Finding

Aeronautics Committee Finding
to NASA Associate Administrator for
Aeronautics Research Mission Directorate

Convergent Aeronautical Solutions Project

Name of Committee:	Aeronautics Committee
Chair of Committee:	Dr. John Borghese, Vice Chair *(for Ms. Marion Blakey, Chair)*
Date of Council Public Deliberation:	December 2, 2015
Short Title of Finding:	Convergent Aeronautical Solutions Project

Finding: The Aeronautics Committee recognized that the Convergent Aeronautical Solutions project is a very innovative approach that provides an incubation cycle to answer big problems. The Committee was impressed with the innovation and number of ideas that are being pursued in a short amount of time. The Committee endorses the approach laid out by the project and feels that it provides tremendous benefit to the Aeronautics Research Mission Directorate mission.

NASA Advisory Council – Committee Finding

Aeronautics Committee Finding
to NASA Associate Administrator for
Aeronautics Research Mission Directorate

University-Led Strategic Aviation Research

Name of Committee:	Aeronautics Committee
Chair of Committee:	Dr. John Borghese, Vice Chair *(for Ms. Marion Blakey, Chair)*
Date of Council Public Deliberation:	December 2, 2015
Short Title of Finding:	University-Led Strategic Aviation Research

Finding: The Aeronautics Committee applauds the Aeronautics Research Mission Directorate for developing a strategy to encourage universities to move into a position of leadership to tackle core technical challenges. The Committee found that this strategy showed leadership in this area. Asking universities to take a leadership role in addressing large ideas is a positive development to utilize their full potential to help shape the future.

NASA Advisory Council – Committee Finding

Aeronautics Committee Finding
to NASA Associate Administrator for
Aeronautics Research Mission Directorate

Unmanned Aerial System Traffic Management

Name of Committee:	Aeronautics Committee
Chair of Committee:	Dr. John Borghese, Vice Chair *(for Ms. Marion Blakey, Chair)*
Date of Council Public Deliberation:	December 2, 2015
Short Title of Finding:	Unmanned Aerial System Traffic Management

Finding: The Aeronautics Committee found that the briefing on Unmanned Aerial System Traffic Management was well prepared and clearly stated the goals of the project. The Committee was impressed by the effort led by NASA and how the concept is being endorsed by the community both by the Federal Aviation Administration and industry.